

REMARKS

A further non-final Office Action (NFOA) mailed October 16, 2009, has been carefully considered, and these remarks are responsive thereto. Claims 1 and 10 have been amended to only refer to a first personal computer. Claim 10 has been amended to delete “entertainment” from “sound adapter.” Now, the word “entertainment” has been completely omitted from independent claim 10 and so dependent claim 11/10 also does not have the object-to word entertainment either. No other claims have been amended.

The Examiner is advised that claims of a foreign corresponding application to the present application filed in Japan have been allowed. Applicants submit this information with the expectation that the allowance may have some impact on the reconsideration of the present claims. After Applicants’ Amendment filed July 28, 2009 accompanied by a Rule 132 Affidavit of Benjuan Zhang (hereinafter, the Zhang affidavit), claims 1-28 of the present application still stand rejected. This amendment is to place the claims in condition for allowance or, in the alternative, better form for appeal.

Applicants respectfully request reconsideration of pending claims 1-28. Applicants address herein what the Examiner represents are issues of non-enablement of average processor load determination, that is, whether a processor load is high or low, and as claimed, for example in claims 7-9 and 27 notwithstanding the Zhang Affidavit of July 28, 2009. Applicants will also address an alleged related issue of the meaning of minimizing processor load raised at Page 7 of the NFOA.

The several rejections made by the Examiner related to Nyhart have been amply addressed in prior amendments and requests for reconsideration and will be minimally addressed here. All prior comments regarding the present claims and Nyhart are incorporated herein by reference from all prior responses to office actions.

In a nutshell, Applicants continue to contend that Nyhart is not an acoustic echo canceller and bears no relationship to the claimed embodiments of claims 1-28. The Examiner now takes the position at Page 4 of the NFOA that Nyhart uses the term sidetone for echo and so “clearly discloses acoustic echo cancelling.” Sidetone is an intentional leakage over wire from a microphone to a speaker of telecommunications apparatus. For example, as defined in Newton’s Telecom Dictionary, Harry Newton, 2000, sidetone is defined as “A part of the design of a telephone handset which allows you to hear your own voice while speaking. The idea is to let

you know that the telephone you're speaking on is working." Acoustic echo has been amply defined in the specification and is shown in Knutson Figure 3. Acoustic echo is related to an external, acoustic path from a speaker to a microphone. Sidetone has nothing to do with acoustic echo in telecommunications technology known to one of ordinary skill in the art.

Enclosed please find a further Affidavit under Rule 132. The present Affidavit under Rule 132 by Jens Cahnbley (hereinafter, "the Jens affidavit") provides further support for a position taken in Applicants' earlier remarks, by Mr. Zhang in his affidavit and in this response, that the specification, represented by, for example, US 2007/0189508 (hereinafter, the '508 publication or, simply Knutson) published August 16, 2007, need not teach average processor load or an average processor load threshold as recited in the claims or minimizing because one of ordinary skill in the software engineering art would readily appreciate the rejected claim features from a known operating system and how to calculate or set same in any number of ways because such was so well known in the art at the time of the invention as represented by the submission of two further articles with the Jens affidavit and the testimony of the Jens affidavit.

The Examiner begins with a *Response to Amendment/Arguments/Rule 132 Affidavit*. The Examiner then identifies remaining § 112 rejections and § 103 rejections re Nyhart. These will be discussed in turn.

Response to Amendment/Arguments/Rule 132 Affidavit

The Examiner "agrees with applicant in that a patent need not teach what is well known in the art" and withdraws "the 112 rejection," but it is not clarified in this section exactly what is withdrawn and what rejections remain except at paragraph 6 re processor load. At Page 3, paragraph 6, the Examiner states: "the examiner maintains that applicant has not disclosed anywhere in the specification that describes how the current and average loads are determined . . . one skilled in the art would not know how to determine the claimed loads with the amount of detail actual given in the specification." Later, at Page 6, the Examiner confirms a lack of enablement rejection of claims 1, 6, 7, 8 and 27 where "applicant has not provided any specific details as to how the system would know the total load on the processor (or every process handled by said processor)." Consequently, the present remarks and newly submitted Jens affidavit will further address the issue of "total load on the processor." It appears that, notwithstanding the position of Mr. Benjuan Zhang, one of ordinary skill in the art, that the

rejected claims are enabled, the Examiner continues to take the contrary position. Applicant agrees with the Examiner that the discussion of Knutson Figure 6 does not specifically discuss how to determine what is a high processor load or a low processor load, an average load or threshold setting or minimizing other than what has been cited to before in prior responses to Office Actions. It is simply Applicants' position that determination of what is high or low processor load or what is average load or a threshold determination are all well known to one of ordinary skill in the art and need not be explained in the Knutson specification and drawings.

The rejections of the present NFOA will now be discussed in turn, beginning with an alleged rejection of claims 1-27 as not enabled. The Examiner is referred to the further Jens Affidavit under Rule 132 and the following remarks re processor load and entertainment.

Claim Rejections – 35 USC 112, first and second paragraphs

Now turning to the **DETAILED ACTION** beginning at Page 5, paragraph 2, pending claims 1-27 are rejected as follows: "The claim(s) contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention." The claims are directed to acoustic echo canceller apparatus and a related method for use in one of a personal computer and a peripheral device. The Examiner then identifies claims 1, 6, 7, 8 and 27 as the rejected claims, but as will be further discussed below, the Applicant believes that the Examiner has misidentified the claims intended to be rejected. First, the question of the skill of Mr. Jens Cahnbley will be discussed as one of ordinary skill in the art.

It is respectfully submitted that one skilled in this art may not be degreed but have considerable experience as a software engineer, especially for interpreting issues related to processor load. Mr. Jens Cahnbley meets or exceeds this level of skill as of March 5, 2004 and is assumed to be one reasonably skilled in the art. Jens has been asked to review the present claim set, the Examiner's remarks regarding lack of enablement, the present application in the form of the '508 publication (Knutson) and provide his remarks in the form of his Rule 132 Affidavit in addition to those of Mr. Zhang's (the Zhang affidavit). The Zhang affidavit is discounted by the Examiner in favor of his own impression of what one of ordinary skill must know to understand Figure 6 of Knutson and the rejected claims. Now the law of enablement will be briefly discussed.

It is further submitted that the **Test of Enablement** is set forth in M.P.E.P. 2164.01 as follows: “Any analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. The standard for determining whether the specification meets the enablement requirement was cast in the Supreme Court decision of *Mineral Separation v. Hyde*, 242 U.S. 261, 270 (1916) which postured the question: is the experimentation needed to practice the invention undue or unreasonable? That standard is still the one to be applied. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Accordingly, even though the statute does not use the term “undue experimentation,” it has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). See also *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”). A patent need not teach, and preferably omits, what is well known in the art,” (our emphasis added). The so-called undue experimentation factors are listed in M.P.E.P. 2164.01(a) as comprising: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

M.P.E.P. 2164.01(a) requires: “It is improper to conclude that a disclosure is not enabling based on an analysis of only one of the above factors while ignoring one or more of the others. The Examiner's analysis must consider all the evidence related to each of these factors, and any conclusion of nonenablement must be based on the evidence as a whole.” It is respectfully submitted that the Examiner has ignored Applicants’ evidence of enablement and continues an enablement rejection without considering the evidence presented as a whole. Moreover, Applicants submit herewith further evidence in the form of another Affidavit under Rule 132, the Jens affidavit, that not only tends to support Applicants’ prior evidence but relates further

evidence that the claimed embodiments and methods meet the **Test of Enablement** in the form of two articles on calculation of processor load and Jens' personal experience in the time frame.

M.P.E.P 2164.04 clarifies: **Burden on the Examiner Under *>the< Enablement Requirement [R-1]**. "Before any analysis of enablement can occur, it is necessary for the examiner to construe the claims. For terms that are not well-known in the art, or for terms that could have more than one meaning, it is necessary that the examiner select the definition that he/she intends to use when examining the application." To date, the Examiner has not specifically indicated a claim construction of the rejected claims 1-27. Later in M.P.E.P 2164.04, it is stated: "For example, doubt may arise about enablement because information is missing about one or more essential parts or relationships between parts which one skilled in the art could not develop without undue experimentation." In particular, the Examiner expresses doubt about average processor load as will be further discussed herein.

It is respectfully submitted that the Examiner has failed to make a *prima facie* case of lack of enablement. On the other hand, M.P.E.P 2164.05 further clarifies "To overcome a *prima facie* case of lack of enablement, applicant must demonstrate by argument and/or evidence that the disclosure, as filed, would have enabled the claimed invention for one skilled in the art at the time of filing," that is as of the date of the filing of the present application under the PCT or March 5, 2004. Moreover, M.P.E.P 2164.05 warns "The examiner should **never** make the determination based on personal opinion. The determination should always be based on the weight of all the evidence."

Firstly, the Examiner has rejected all claims 1-27 as failing to meet the enablement test (without ever referring to the test of "undue experimentation.") Indeed, it is not clear whether the Examiner considered the test (2164.01) at all. Deficiencies in the specification and claims as originally filed appear to lie in only one remaining area: that one skilled in the art would not be able to determine an average load of a processor and, in particular, the features of claims 1, 6, 7, 8 and 27. This deficiency, as well as related alleged deficiencies, is discussed in the Rule 132 affidavit and below.

Repeatedly, Applicants have pointed to specific elements or relationships between elements that are fully described by the specification, and the Examiner has ignored Applicants' guidance and provided in its place his own opinion.

Applicants will now address alleged non-enablement of Processor Load.

Processor Load

Processor load appears to be related to the following claims: 7-9, 18-19 and 27. The examiner, at Page 6, rejects claims 1, 6, 7, 8, 27 finding on his own that “applicant has not provided any specific details as to how the system would monitor the total load on the processor (or even every process handled by the processor). Further the applicant has not provided any timing diagrams or algorithms by which the processor determines the ‘average load.’” Claims 7-9, 18-19 and 27 relate to “an average load threshold” or “average load.”

Then, the Examiner at Page 7, states that it is not clear what ‘minimizing’ the use of a processor would entail. This comment is couched as a rejection of claims 6-8 and 27 as a rejection under 35 U.S.C. §112, second paragraph. To the contrary, it is clear from these claims, from the specification and as explained by the Jens affidavit, that “minimizing” relates simply to making a decision whether to load a processor with training or not to load the processor with training tasks based on average load or threshold. The Examiner raises the question at Page 6, line 4 as to how to monitor “total load” “or even every process handled by the processor” and then at line 6, how to determine average load. The answers include, for example, per the Jens affidavit, using well known parameters of a performance counter and determining a threshold, for example, depending on the application of the processor and the type of operating system. According to the Jens affidavit, one of ordinary skill following, for example, published articles preceding March 4, 2005, describe means for determining total processor load as a percent, number of interrupts and the like and one may set an average over time, for example, based on the application of the processor and the type of operating system for when to have the processor perform acoustic echo canceller training and when not to have the processor perform acoustic echo canceller training.

With respect to rejected claim 1, there is absolutely no discussion of processor load. Applicant urges reconsideration of claim 1 and withdrawal of the rejection of claim 1 under 35 U.S.C. §112, first paragraph. Also, claim 6 is silent about processor load. Applicant urges reconsideration of claim 6 and withdrawal of the rejection.

On the other hand, applicant agrees that claims 7 and 8 relate to processor load but take the position that it is not necessary for applicant to teach what is already well known in the art, for example, in claim 7 “minimizing use of the processor when a current load of the processor is above an average load threshold for the processor” and in claim 8/7 “minimizing comprises

collecting audio data samples from one of the microphone and the speaker and restricting use of the adaptive filter (training) until the current load of the processor is below the average load threshold for the processor.” Claim 27 relates to “operating said non-training audio application for training the acoustic echo canceller so long as a processing load on said processor of said electronic device is less than an average load of said processor of said electronic device” and so is just as well known to one of ordinary skill as the minimizing of claims 7 and 8.

It is not applicant’s position that Knutson teaches determining an average load or a threshold, it is applicant’s position that “minimizing” and “operating” requiring setting an average load or average load threshold does not require timing diagrams or algorithms as alleged by the Examiner at Page 7, line 5, of the NFOA, but rather the calculation of average load and determining a threshold requires simply the use of well-known parameters such as % total processor time to establish (see Jens affidavit and attached articles).

One skilled in the art of computers and operating systems in which the present acoustic echo canceller is employed would readily recognize that the operating system may provide such output as indications of load. As described, for example, in paragraph [0058]-[0059]: “Adaptation and filtering are only practical when audio is coming out of the system. Either an audio application must be running, or the Operating System (OS) must generate a sound. Thus, it is determined whether an audio application is currently being executed by the OS or whether the playing of a sound is being initiated by the OS (step 605). If so, the method proceeds to step 610. Otherwise, a return is made to the operating system. It is to be appreciated that the sound may be, but is not limited to, a sound relating the arrival of an e-mail, an indication sound of some event (e.g., a notification of an incoming call, a conference call reminder, a warning, etc.), and even a pre-specified sound sequence also used for a purpose other than solely training the echo canceller.” It is respectfully submitted that the Examiner’s suggestion of timing diagrams and the like to show processor determination of average load is inapplicable. To the contrary, FIG. 6 and its attendant description are urged to provide thorough details of a processor load algorithm which does not require undue experimentation. It is again respectfully submitted that the specification and FIG. 6 provide ample discussion of processor load and the use of an adaptive counter for acoustic echo canceller control (training).

As supported in the Zhang Affidavit under Rule 132, a typical average load of a personal computer is readily available through TOP or WINDOWS provided task management to output

an average processing load. A threshold range for a typical computer is well known to one skilled in the art for a non-real time computer but may vary from computer to computer and whether the computer must operate in real time or not. Thus, when the load is lower than an average, training can occur, and the echo canceller is run continuously using all audio samples at step 650; otherwise, if high, the adaptive counter is incremented at 615. See, for example, paragraph [0059].

The Examiner finds the Zhang affidavit unconvincing and is now supplemented by the Jens affidavit. The Jens affidavit, in turn, is supported by two articles which exemplify parameters obtainable via an operating system for determining a high load versus a low load and “minimizing” as recited.

It is respectfully submitted that one skilled in the art would understand the terms of the rejected claims and understand the features from the specification (for example, paragraphs [0058] and [0059]). Per paragraph [0059], for example, “Depending on the average processor load, different approaches can be taken to adapt the acoustic echo canceller filter. Thus, at step 610, it is determined whether the average processor load is low or high. If the average processor load is low, then the acoustic echo canceller can operate continuously, using all audio samples (step 650), and then a return is made to the operating system. Otherwise, if the average processor load is high, then the filter is adapted intermittently. To adapt the filter intermittently, a counter (hereinafter “adaptive counter”) is used, and a value of the adaptive counter is incremented (step 615). It is to be appreciated that the present invention is not limited to the use of a counter to intermittently adapt the adaptive filter and, thus, other approaches may also be employed while maintaining the spirit of the present invention.”

When the totality of the evidence is considered and in view of FIG. 6 and its detailed description and the fact that one skilled in the art would readily recognize an average load and/or threshold for a given processor and operating system, Applicants respectfully submit that the specification enables one to practice rejected claims 1, 6, 7, 8 and 27 or understand the alleged indefiniteness of claims 6-8 and 27 and, for example, “average processor load” without undue experimentation. Applicants respectfully request reconsideration of the rejections of these claims pursuant to 35 U.S.C. §112, first and second paragraphs, in view of all the evidence that the combined set of claims 1, 6-8 and 27 have features which are enabled because the features are well known to one of ordinary skill in the art and also not indefinite.

Entertainment

At Page 6, Section 2, the Examiner rejects claims 1-27 as indefinite for use of the phrase “entertainment.” Applicant has deleted “entertainment” from claims 10-11 and 21-22 and the rejection of these claims is believed to be rendered moot thereby. The Examiner alleges that the phrases “entertainment sound adapter” and “entertainment application” are not clearly defined. Yet, entertainment is defined by way of example, for example, at Knutson [0024], as: “entertainment (e.g. music, multimedia, etc.).” Also, sound adapter 199 is introduced at Knutson [0029] and would be well known as a sound card of a personal computer. To the contrary, the Examiner goes beyond the specification and suggests that “any type of audio signal” may be considered “entertainment.” Thus, Applicants continue to traverse the alleged vagueness of the term “entertainment.”

The title of Knutson is Acoustic Echo Canceller with Multimedia Training Signal. At Knutson paragraph [0044], it is stated: “at high sample rates for entertainment quality audio” where it is recognized that audio music, for example, may involve a high sampling rate in order to enjoy if played as an analog signal through a speaker.

There is provided a grocery list of what may be considered entertainment that falls within this definition at Knutson paragraph [0047]: “video games, playing MP3s, CDs, or other audio files, playing video files.” Finally, at paragraph [0064], it is stated: “What the microphone hears is not being used in communications when entertainment applications are running.” In summary, the Examiner is referred to the following paragraphs for entertainment, application and sound adapter: [0024], [0029], [0044], [0047], [0054] and [0064]. It is respectfully submitted that one skilled in the art would readily appreciate the meaning of “entertainment sound adapter” and “entertainment application” by way of the examples provided in the specification of “entertainment,” entertainment applications and a sound card, audio card, sound adapter used for “entertainment.”

It appears as if the lines are clearly drawn for appeal. The Examiner takes the position that what a sound adapter or typical sound card does is unclear from the specification and so entertainment application (for example, to play a DVD) or entertainment sound adapter (to play music or a CD) is unclear. It is Applicants’ position that entertainment would be perfectly clear to one of ordinary skill in the art.

The Applicants will briefly address a rejection of claim 4/1 for indefiniteness. Confusion arises apparently because claim 1 was previously amended to differentiate a first personal computer from a second personal computer. The omission in claim 1 of any reference to a peripheral or second personal computer is believed to overcome the rejection of claim 4/1. Applicants request reconsideration and withdrawal of the rejection of claim 4/1 for indefiniteness.

Claim Rejections – 35 USC 103

The Examiner at Pages 8-15 provides a detailed rejection based on Nyhart et al., US 5,553,137 including an **Additional set of rejections**. It is respectfully requested that the Examiner state his rejections once for purposes of appeal and combine his rejections at pages 8-11 and 11-14 for purposes of clarification and simplification. The Examiner at pages 8-15 seems to urge inherency using Nyhart. For example, at page 8, “any number of signaling frequencies could have been chosen for the telephone and audio signal used for training.” At Page 9, the Examiner states: “The Examiner contends that once the echo has been reduced to an acceptable threshold, the system inherently comprises a counter (clocking) in order to signal the rest of the system that the training has been completed.,” also, “It would have been obvious to one skilled in the art that computers could be networked for the inherent advantage of sharing resources.” Page 10 begins, “It would have been obvious to one of ordinary skill in the art at the time of this application that an echo canceller could be implemented on a phone (which is also a conferencing device) or computer with a known interface (USB, 1394) that produces the external audio signal for training for the purposes of removing echoes from those devices.” Also on page 10, “The ADC inherently comprises a “sample rate converter: which will resample any input signal into the preset sampling rate (which will be the same as the telephone signaling (conferencing application).” These are but examples of the number of inherency allegations for which Applicants respectfully request substantiation because as shown below, none of the independent claims are inherent in view of Nyhart because as Applicants opine, Nyhart fails to disclose or suggest an acoustic echo canceller of any kind.

Applicants will address the claimed acoustic echo cancellation out of sequence of the Examiner’s stated rejections because Applicants believe that understanding Nyhart and the

sidetone echo Nyhart is canceling versus the disclosure and claims of the present invention is key to an appreciation of the differences between Nyhart et al.'s sidetone echo canceller and the claimed structure of claims 1-28 for an acoustic echo canceller.

Claim 1 is repeated here for clarification: A method comprising:

implementing a telecommunications application of an electronic device, said electronic device comprising a first personal computer;

sampling a telecommunications signal of said telecommunications application at a first sampling rate; and

utilizing sound output of an entertainment sound adapter of said electronic device, said entertainment sound adapter output being sampled at a second higher sampling rate than said first sampling rate, said entertainment sound adapter output corresponding to a non-training audio application of said electronic device to train an acoustic echo canceller in a background of said telecommunications application.

The method of claim 1 is clearly described and supported as discussed above, for example, by FIG.'s 1 through 8 and the specification when taken as a whole. Acoustic echo cancellation is defined as the echo resulting from "sound that emanates from a speaker being fed back into a microphone." The Examiner is referred to the acoustic echo paths (AEP) shown in FIG. 3 which occur in the air as feedback from speaker to microphone and not entirely within a telephone system (like sidetone). Nyhart et al. relates to a different type of echo – sidetone echo. Beginning at col. 1, line 13, Nyhart states: "Many telephone systems, particularly cordless telephone systems, are defined to operate in urban environments which have a high level of ambient noise. In telephony, sidetone is defined as an attenuated level of one's own voice heard in the telephone handset ear piece. In telephony systems in which there is a delay to the audio path, the sidetone produced by the 4 wire to 2 wire reflection (from a conversion hybrid such as "standard hybrid" 128) will sound like echo. This (sidetone) echo can be annoying to the user to the point of disrupting the ability to communicate on the telephone." Sidetone occurs in the handset (not in the air) among the microphone, hybrid and speaker so that a person's voice can be heard at the speaker, and the echo is caused by the hybrid 128. See also col. 2, ll. 63-66. Hence, per Nyhart FIG. 1, the Nyhart echo cancellation of sidetone echo involves the base station 102 and the controller 122, DSP 124 and hybrid 128 with paths 130.

An air path AEP (Knutson Fig. 3B and 3C) between speaker 108 and microphone 106 has nothing to do with sidetone echo cancellation. An acoustic echo path is shown in Knutson FIG. 3A, 3B and 3C “relating to the feedback of a speaker output to a microphone input” of the devices shown, Knutson paragraph [0038], for example, a personal computer. The Examiner persistently fails to appreciate the difference between sidetone echo cancellation and acoustic echo cancellation. The Examiner fails to appreciate the difference between an electronic device such as a personal computer (and a peripheral) and a cordless telephone. The Examiner fails to appreciate the significance of sampling at first and second sampling rates where, for example, entertainment audio is sampled at a high rate and telephony at a low rate and matched at the lower rate as indicated above for the advantages indicated above when Nyhart only relates to telephony. Moreover, the Examiner fails to appreciate: “said entertainment sound adapter output corresponding to a non-training audio application of said electronic device to train an acoustic echo canceller in a background of said telecommunications application.”

Nyhart only mentions microphone 106 and speaker 108 once in Nyhart’s entire specification.

Until the Examiner is able to understand that there is a clear difference between an acoustic echo canceller and associated structure and a sidetone echo canceller and related structure, Applicants continue to maintain their position that claims 1-28 are patentably unobvious in view of Nyhart or applicants’ admitted art applied thus far by the Examiner.

Applicants respectfully request an interview with the Examiner to discuss independent claims 1 (newly amended), 10 (amended to delete “entertainment”), 12, 21 and 23 and must respectfully repeat the same arguments and remarks made previously in response to the plurality of office actions issued in this application. Applicants respectfully submit that a dialog with the Examiner may result in an understanding by both of each other’s respective positions and perhaps to passage to issue of the present application. Applicants, with the presentation of the Jens affidavit believe that their next action will be to appeal, assuming the Examiner persists in his position.

The Examiner at Page 8 in the most recent NFOA rejects claims 1-4, 9-15, 20-22 and 27 under 35 USC 103(a) as being “anticipated” by Nyhart et al. (5,553,137). The Examiner is respectfully requested to clarify the rejection as “anticipated” (§102) or “obvious” (§103). At Page 9, the Examiner further rejects claims 4, 5, 7-8, 15-16, 18-19, 23-26 and 28 under 35 USC

103 as being unpatentable over Nyhart et al. (5,553,137) (hereinafter, Nyhart) as applied to claims 1 and 12. At Page 11-12, under **Additional set of rejections**, the Examiner further rejects claims 1-4, 9-15, 20-22 and 27-28 as unpatentable over applicant's admitted prior art (Knutson paragraph [0005] re "adaptive filter") and further in view of Nyhart. Finally, at Page 14, the Examiner rejects claims 5, 6-8, 16-19 and 23-26 as unpatentable over applicants' admitted prior art in view of Nyhart as applied to claims 1, 12. Again, the statement of these rejections should be consolidated to the extent possible for purposes of appeal so that Applicants may more properly address the rejections and understand them.

The Examiner is off base on many counts. For example, the Examiner states at Page 12, 6, regarding claims 1 and 12, "applicant's admitted prior art discloses known acoustic echo cancellers" – perhaps a reference to Knutson [0005]. The Examiner then proceeds to use this to suggest that Nyhart discloses an echo canceller technique as claimed. No one in view of a known acoustic echo canceller would appreciate the arrangements of claims 1 and 12 from Nyhart.

At Page 11, the Examiner raises the adaptive filter admitted prior art of Knutson paragraph [0005] regarding claims 6 and 17. But nowhere does the applied reference Nyhart discuss a filter as recited. The Examiner states: "The digital system inherently comprises means to delay all signal paths so as to synchronize the signals (to give 'real time' bidirectional communication.) (spec., pages 1 and 2). It would have been obvious to one of ordinary skill in the art at the time of this application to implement well known echo canceller features like a filter and delay means for the purpose of implementing the disclosed canceller" (our emphasis added). It cannot be stated enough that Nyhart and Knutson et al. provide different echo cancellers in different structures and their methods are for different purposes. Knutson teaches no need for synchronization. The Examiner's inherency arguments all fail as personal opinion without basis in fact for impermissible hindsight reconstruction. Moreover, Nyhart, for example, describes no delay, no entertainment application or any need to match delays or discussion of processor load.

Again, the "admitted prior art" at paragraph [0005] of the specification comprises a reference to adaptive filters used to perform acoustic echo cancelling. Indeed, an "adaptive filter" is disclosed at paragraph [0005], where it is further stated that "the stored coefficients will be invalid or possibly worse than starting from a zero coefficient point." At paragraph [0006],

Applicants state: “Another approach involves reducing the local speaker volume when a local user is speaking into the microphone so as to reduce the canceling requirements of the adaptive filter.” Nyhart fails to address these problems, barely mentioning a microphone and a speaker of a cordless phone.

Consequently, the Examiner’s use of so-called admitted prior art is respectfully traversed as teaching anything other than what is stated in the specification. The Examiner must provide some citation to a reference which teaches what the Examiner alleges the prior art teaches beyond the admitted prior art at pages 1 and 2 of the specification, for example, “The digital system inherently comprises means to delay all signal paths so as to synchronize the signals. . .” This is a statement of opinion, not fact, and certainly does not come from Nyhart.

With respect to “inherently comprises means to delay,” the Examiner states at page 15 of the NFOA: “It would have been obvious to one of ordinary skill in the art at the time of this application to implement well known echo canceller features like a filter and delay means for the purpose of implementing the disclosed canceller.” This does not come from Nyhart and is a statement of opinion, not fact. Then, at page 15, the Examiner repeats the same comments as part of an **Additional set of rejections. This is one example of where the Examiner may improve conciseness for the purposes of understanding the rejections and for purposes of appeal.**

This is but one example of the confusion as to what is rejected and on what basis when the burden is on the Examiner to demonstrate a *prima facie* rejection based on obviousness and non-enablement.

Features of claimed embodiments missing from Nyhart

We now again summarize the allegations of the Examiner regarding Nyhart and identify features of claimed embodiments missing from Nyhart. The Examiner states: “Nyhart discloses an acoustic echo canceller (col. 1 lines 21-40) that trains on non-training audio” (NFOA, Page 18, 2.) regarding claims 1-4, 9-15, 20-22 and 27. The Examiner states that Nyhart trains on non-training audio referring to “the incoming microphone signal” regarding claims 1 and 12. Applicant again traverses because sidetone echo is not acoustic echo and Nyhart’s sampling rates would not include, for example, multimedia or CD quality sound because it is a telephone.

There is a discussion in the Nyhart BACKGROUND of using “sidetone” which is the intentional combination of microphone pick-up to be heard by the near end caller or background noise which can result in the following: “an increased chance that the near end user will begin speaking before convergence. This in turn results in the near end user initially hearing his sidetone as the canceller converges. If the noise level is increased to a level higher than background noise, the far end user may hear the added noise for the duration of the training of the canceller.” Thus, the approaches taken in Nyhart’s BACKGROUND have problems that remain unsolved and teach away from Applicants’ claims involving an acoustic (not a sidetone) echo canceller. They teach away from Applicants’ claimed embodiments because Nyhart has no concept of utilizing sound output of an entertainment sound adapter of an electronic device to train an acoustic echo canceller of the device in a background of a telecommunications application. Nyhart strictly relates to telecommunications and, in particular, “In response to noise generated between the dialing of digits, the echo canceller converges on noise to optimize sidetone,” (Nyhart, col. 2, ll. 1-4) Nyhart involves “first and second radios and a base station having an echo canceller,” (Nyhart, col. 1, ll. 57-60) where the echo canceller is a sidetone echo canceller.

As introduced in the Nyhart ABSTRACT, Nyhart teaches and suggests training “on noise generated by the echo canceller (124) during inter digit dialing.” In particular, at col. 3, ll. 11-28, the DSP 124 generates low level white noise in a pseudo random (PN) sequence onto the two wire phone line 126 during inter digit dialing with the result: “The echo canceller 124 is thus trained during the inter digit dialing time before two way communication between the near end and far end users is established.” This is not a disclosure or suggestion of Applicants’ claimed embodiments using an entertainment sound adapter in an acoustic echo canceller.

Applicants’ claims 1-28 clearly recite distinctions and features that one of ordinary creativity or one using common sense (see *KSR v. Teleflex guidelines re “obviousness”*) in view of Nyhart or the admitted prior art would not obtain without the use of improper hindsight reconstruction. Moreover, Nyhart and the admitted prior art teach away from the recited non-training audio application, for example, an entertainment application playing in the background of a telecommunications application having a first sampling rate and the non-training audio application having a second higher sampling rate.

Nyhart fails to discuss any other audio signal for training than noise generated as low level white noise by DSP 124 (col. 3, ll. 12-28). This is not a disclosure, for example, of “utilizing sound output of an entertainment sound adapter of said electronic device, said entertainment sound adapter output being sampled at a second higher sampling rate than said first sampling rate, said entertainment sound adapter output corresponding to a non-training audio application of said electronic device to train the acoustic echo canceller in a background of said telecommunications application.” Nyhart has no entertainment sound adapter (no sound card of any kind) and is not an electronic device as recited. There is no concept in Nyhart of a sound output of an entertainment sound adapter or sound adapter for training. Nyhart uses low level white noise. It is not sound output of an entertainment sound adapter of an electronic device. Per claim 2/1, Nyhart, for example, has no “entertainment application” or “program audio” which clearly differentiates from noise. Claim 3/2/1 specifies “streaming audio sound” which is not white noise.

The Examiner suggests at Page 8, regarding claim 10, that “the dialing tones” are used for training; (the Examiner states no grounds of rejection for claim 21). Applicants respectfully disagree that dialing tones are used for training. Nyhart, col. 3, explains that the dialed digit is reflected and is used to mute the audio so that the echo canceller can generate *noise* for training: “Referring now to Fig. 3 there is shown a flowchart 300 representing the preferred embodiment describing the training (or convergence) technique used during the dialing sequence . . . As the user dials in the first digit at step 310 the near end piece hears the reflected digit being dialed at step 312. The audio to the near end piece is then muted in step 314. Once the audio to the ear piece is muted *the echo canceller generates noise, preferably low level white noise*, onto the phone line at step 316. The echo canceller converges on the reflected noise signaling step 318. . . allowing it to converge only during inter digit dialing time,” (our emphasis added).

The Examiner fails to construe, for example, “streaming audio sound” of claim 3/2/1 properly at Page 9. True, “audio” is audio, but “streaming audio sound” requires more.

An advantage of embodiments involving an adaptive filter as an acoustic echo canceller using background training via an (entertainment) sound adapter is that “background training would not need to operate continuously” as stated at page 13 of the specification (paragraph [0047] of the published application): “idle cycles of the processor can be used to train the echo canceller whenever the speaker is used, whether in video games, playing MP3s, CDs, or other

audio files, playing video files, or even during the typical bells and whistles of the PC alerting the user to emails and other warnings.” Consequently, no PN noise generation is required as in Nyhart. An (entertainment) sound adapter of an electronic device is present for other purposes than acoustic echo canceller training. Applicant’s amended claims discuss an (entertainment) sound adapter that is used for non-training and for training of an acoustic echo canceller. The Examiner still does not address this advantage. The Examiner is referred to MPEP 707.07(f): ANSWERING ASSERTED ADVANTAGES. Nyhart is not background training. While Nyhart training occurs during interdigital dialing and so does not need to operate continuously, Nyhart is limited to operating only during a brief portion of a “telecommunications application” and certainly not in a background of a telecommunications application.

Claim 2/1 reads, for example: “the non-training audio application is an entertainment application,” and there is no entertainment application in Nyhart and no “entertainment sound adapter output” or output that includes “program audio”. White noise is not entertaining and is not program audio. To the contrary, white noise is annoying.

Claim 3/2/1 refers to streaming audio sound, and Nyhart fails to refer to “streaming audio sound.” This is not a mere audio signal – it is “streaming audio sound.”

Claim 4/1 discusses an entertainment application of said first personal computer, and Nyhart fails to discuss such an application, for example, music and multimedia.

Claim 5/1 relates to matching sample rates as supported at paragraph [0044] to communication sampling rates. The Examiner cannot produce “sample rate conversion” out of thin air from Nyhart or inherency – the alleged inherent composition is clearly impermissible hindsight reconstruction of claim 5 from absolutely no disclosure in Nyhart of sample rates, their conversion or matching.

Claim 6/1 relates to “a microphone” and “a speaker” of “said electronic device” of claim 1 which admittedly may be associated with a telecommunication application but must be construed in the context of claim 1. Moreover, an adaptive filter is recited along with paths from the speaker and the microphone to the adaptive filter. Nyhart does not discuss these features in the context of claim 1 including an entertainment sound adapter. Nyhart barely mentions microphone 106 and speaker 108 of handset 104 and so does not relate at all to acoustic echo cancellation.

With respect to claim 7/6/1 and 8/7/6/1, the Examiner states that it would be obvious to balance and manage processor resources. Yet, the Examiner provides no support in Nyhart or any reference to any balancing as recited when both a telecommunications application and a non-training audio application are playing with the latter playing in a background for acoustic echo canceller training. Nyhart only appears to run a communications application. Referring to FIG. 6, the present specification supports a loop 601, 605, 610 which is support for a “processor load, high or low” box (610) and running a canceller continuously (650 when low) depending on the result.

Claim 9/8/7/6/1 is rejected based on another inherency argument (Page 9). Yet, the Examiner fails to cite to any reference related to, for example, “an adaptive counter to count a number of training calls to the acoustic canceller.” The Examiner is again referred to FIG. 6 and the loop 601, 605, 610, 615, 620, 655 where (605) represents “audio application/other sound.” If the load is high at (610), incrementing an adaptive counter (615) where if the adaptive counter value is greater than a value (620), the filter is not operated (655). Adaptive counter 854 is introduced at paragraph [0053] and further discussed at paragraphs [0057]-[0062]. Nyhart has no such adaptive counter and fails to discuss the features of claim 9/8/7/6/1.

Claim 10 is an independent claim related to a further embodiment for an acoustic echo canceller involving “a sequence of frequencies” and “an event unrelated to training.” Nyhart arguably during digit dialing outputs “a sequence of frequencies” such as so-called touch-tone dialing frequencies (the Examiner may consider white noise or dialing tones as a sequence of frequencies), but Nyhart teaches interdigital training, not during digits. As suggested above, Nyhart does not discuss “utilizing sound output of an entertainment sound adapter of an electronic device . . .” Claim 11/10 defines the event unrelated to training as some event other than outgoing calls involving interdigital dialing so Nyhart does not discuss the recited event. Claims 21 and 22/21 are related and are patentable for the reasons that claims 10 and 11 are patentable.

Claim 12 is an independent claim that relates to an acoustic echo canceller involving “an entertainment sound adapter of an electronic device” and “an adaptive filter adapted to be trained using sound comprising audio output of said entertainment sound adapter” and related features not discussed by Nyhart.

Further claims contain similar features to those already discussed which are not disclosed in Nyhart and are not inherent in Nyhart as suggested by the Examiner. Again, it is respectfully submitted that all such inherency arguments are improper hindsight reconstruction of Applicants' claimed embodiments and requests that some reference be cited which provides a discussion of the alleged inherent component or feature.

Again, at best, Nyhart and the admitted prior art together teach PN sequence noise generation during inter-digit dialing and an adaptive filter for sidetone echo cancellation which has nothing to do with acoustic echo cancellation. Claims 1-28 contain features undisclosed by the cited and applied prior art such as an (entertainment) sound adapter for training an acoustic echo canceller.

Applicants again respectfully request reconsideration of the rejection of claims 1-28 and look forward to prompt allowance of the application or a more condensed statement of rejections for the purpose of appeal. The Examiner is urged to contact Thomas Jackson, Registration No. 29,808, located in the District of Columbia to schedule an interview which may include Paul Knutson to answer questions and establish a dialog in this application which may lead to allowance and not continued impasse. Should the Examiner have any questions on this request, the Examiner is urged to contact the undersigned attorney of record at the telephone number and address given.

Respectfully submitted,
Paul Knutson, et al.

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Date: January 7, 2010

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Enclosure: Affidavit under Rule 132 of Jens Cahnbley and two attached articles